REMARKS

Reconsideration and allowance is requested in view of the following remarks and amendments. Claims 1-6 and 9-24 are currently pending in connection with the present application, with claims 7 and 8 being cancelled without prejudice or disclaimer of the subject matter contained therein. Claims 1, 21, and 23 are independent claims. By this amendment, claim 1 has been amended. Claims 21-24 have been added to the application. There is no new matter.

Applicant respectfully traverses the rejections set forth in the Office Action dated February 23, 2005.

DESCRIPTION OF AN EXAMPLE EMBODIMENT

An example embodiment relates to a method for handling a database containing objects in a multidimensional-coordinate system. The coordinate system is divisible into a plurality of multidimensional intervals (Fig. 2 and Fig. 6, elements 61-69). The example embodiment allows for optimized calculations relating to objects within a neighboring region. The ability to quickly and efficiently identify objects within a desired distance without having to employ a brut-force algorithm allows for quick calculations regarding object relationships, strength relationships, and collision analysis of geometrical models for various applications, such as CAD and geographical systems.

The example embodiment dynamically divides an interval into several smaller intervals of, for example, equal dimensions to obtain a dynamic space map, wherein each object is associated with at least one interval, and in which several intervals may be associated with at least one object. (Fig. 3 and page 7, lines 32-36). This many-to-

many relationship can be used to obtain important information as to the relationship between objects. The size of an interval indicates how close the objects within it are to other adjacent intervals. As the number of objects within an interval increases beyond a threshold value, the interval is divided into two smaller intervals of equal dimensions for example, which may be implemented using binary arithmetic. Each interval may contain the same number of dimensions as the coordinate system. By dividing the intervals into smaller intervals of equal dimensions using a binary division strategy, the example embodiment simplifies the process of performing distance measurements and proximity calculations within the data space.

Fig. 3 illustrates how the model and the intervals in the example embodiments are represented in the database 1. Each model 10 is linked to the various intervals 22-25 into which it extends. Similarly, each interval 22-25 is linked to the objects contained within it (Fig. 3, elements 49). Every time an object is inserted into the database, it is assigned a reference to one or more intervals. Each of these intervals in turn is then assigned a reference back to be newly inserted object. This relationship comprises the many-to-many relationship of the objects and intervals of the example embodiment.

35 U.S.C. § 101 Rejection

Claims 1-20 stand rejected under 35 U.S.C. § 101 based upon the allegation that the claimed invention is directed to non-statutory subject matter. While Applicant disagrees and does not admit that the rejection is correct, Applicant submits that this rejection is now moot in view of the amendments made to claim 1, particularly that claim 1 has been amended to include "a computer database system". Such an amendment

has been made in an effort to expedite prosecution. Accordingly, withdrawal of the rejection is respectfully requested.

35 U.S.C. § 102(e) Kothuri Rejection

Claims 1-20 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Kothuri et al. (U.S. Patent No. 6,505,205). Applicant respectfully traverses this rejection.

Kothuri teaches a system and method for indexing and storing multidimensional or multi-attribute data. Objects are recursively sorted into selected dimensions and divided until each object fits into a subdivision having a specified fan-out factor, represented by a leaf node. When an interval is divided, the distribution of objects in each dimension is analyzed, and the dimension with the widest object distribution is divided adjacent to the median object, creating two separate nodes. Each of these sub-divisions is recursively compared and divided until each node contains only the allowable number of objects. The data space is represented using an R-tree with a root node (Fig. 4, element 402), with multiple levels of nodes 412 and 414 and leaf nodes 420-426 underneath a root node. Data items are sorted into the various leaf nodes using a many-to-one relationship, such that each object can only be associated with one leaf node, while one lead node may be associated with a predetermined maximum number of objects (col. 15, lines 56-60, col. 16, lines 25-31).

In regards to claim 1, Applicant has amended the last section of the claim to read "dividing ... the interval into at least two smaller intervals **of equal dimensions**". The Examiner has alleged that column 3, lines 47-50 suggest that the interval is divided into two intervals of equal dimensions. Column 3, lines 47-50 of Kothuri state that "when a

dividing dimension is selected, the data items may be sorted in that dimension and then divided into two or more subsets that contain **equal or nearly equal numbers of data items**." This does not meet the above-mentioned limitation of claim 1.

Kothuri teaches that data is sorted in a dimension having the greatest variance and the sorted dataset is then divided in that dimension as close to the median value as possible (col. 10, lines 50-53). Col. 10, lines 66-col. 12, line 6, teaches the methodology for dividing the data space into subdivisions based on the location of the median data object.

Applicant submits that there is a distinct difference between two intervals of equal dimensions and two intervals of "equal or nearly equal number of data items." Kothuri teaches an equal number of data items which refers to the number of objects within a node. Claim 1 refers to "at least two smaller intervals of equal dimensions", which clearly refers to a division based on the dimensions used to represent the interval, not based on the distribution of the data items. Thus, withdrawal of the rejection is respectfully requested.

Furthermore, for at least for the reasons discussed above, claims 2-6 and 9-20 are patentable because they derive from independent claim 1.

NEW CLAIMS

Claim 21 discloses the features in original claim 1, also including the revised phrase of "comparing the determined number of objects with a pre-determined threshold value **in each interval in which the object has an extension**". Applicant submits that Kothuri's invention limits data to a many-to-one, object to node, relationship. Kothuri's

many-to-one relationship is evinced in the disclosed process of inserting a data item into the R-Tree such that "the R-Tree is traversed from the root to find an appropriate **leaf node** in which to insert the data item" (col. 16, lines 18-19). When an item overlaps two or more nodes, "the leaf node whose MBA (minimum bounding area) increases in size the least is chosen" (col. 16, lines 31-32). The minimum bounding area refers to the bounding area of a given leaf node (Fig. 1, elements B1, B2, 112, 114, 122 and 124). The association of each object with only one leaf node clearly shows the many-to-one relationship between nodes and objects. Furthermore, Kothuri states the "each data item is stored or associated with a leaf node" (col. 16, lines 56-57).

Therefore, Kothuri cannot disclose "determining which multidimensional intervals the object has an extension in" **and** "comparing the determined number of objects with a predetermined threshold value in each interval in which the object has a extension" as disclosed in Applicant's claim 21.

At least for reasons somewhat similar to those discussed above, claim 23 also overcomes the teachings of Kothuri. For the reasons set forth above, Applicant believes that new claims 21-24 are patentable.

CONCLUSION

Accordingly, in view of the above amendments and remarks, reconsideration and withdrawal of all outstanding objections and rejections and allowance of each of claims 1-6 and 9-24, is respectfully requested.

Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), Applicant hereby petitions for a two (2) month extension of time for filing a reply to the outstanding Office Action and submit

the required $450.00 extension fee herewith.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Donald J. Daley at the telephone number of the undersigned below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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